Remarks

Claims 1-7 and 10-19 are pending in the application. Claims 8 and 9, previously withdrawn from consideration pursuant to a restriction requirement, are cancelled herein without prejudice to the filing of a divisional application. Reconsideration is requested in view of the above changes and the following remarks.

Applicant thanks Examiners Oltmans and King for the courtesy of the interview of July 31, 2003.

Claims 1 and 10 have been amended. The preambles have been amended to point out that a feature of the substrate forms the contained space. Support is found at page 8; lines 10-12. Support for new claims 15-19, listing certain features, is found in the specification at page 8, lines 10-12.

Part (b) of claims 1 and 10 has been amended to more particularly point out and define the invention. Claims 1 and 10, as amended, recite that the halide activator reacts with the aluminum ions from the aluminum source to form an Al-halide intermediate within the contained space, which Al-halide intermediate reacts with the target surface. The latter forms an aluminide coating on the target surface. This reaction sequence is supported by the disclosure of the specification at page 13, line 30 to page 14, line 4, and page 14, lines 24-26.

The same amendment setting forth the reaction sequence has been made to allowed claims 6 and 7.

Claims 5 and 14 have been objected to as being dependent on a rejected base claim, but would be allowable if rewritten in independent form including the limitations of the base claim and intervening claims. Claims 5 and 14 have been rewritten in independent form to incorporate the features of the respective base claims, and further to recite the reaction sequence indicated above.

Claims 1-4 and 10-13 stand rejected under 35 USC 103 as being allegedly unpatentable over Draghi *et al.* ("Draghi") in view of Olson *et al.* ("Olson"). Reconsideration is requested in view of the above changes and the following remarks.

Draghi teaches a method for turbine vane reclassification by adding a controlled amount of an alloy to a specific area of an article where deterioration has occurred. One or more layers of a tape are applied to the article. The tape includes a mixture of an adhesive binder and an alloy powder. The article is heated to decompose the binder and melt the powder (col. 5, lines 1-

2). The melted alloy powder diffuses into the alloy of the substrate. So much material is deposited that a final machining step is required to blend the edges of the deposited material, to yield a smooth contoured surface. Draghi remarks that in the course of the process, any cracks in the substrate are filled. Draghi's process does not apply a coating to the crack and preserve the crack's underlying shape, but eradicates the crack by completely filling it in with alloy.

According to the present invention, an aluminide coating is formed on a target surface of a metal substrate bounding a contained space formed by a *feature* on the substrate. It is apparent from the specification at page 8 that a feature is a man-made occurrence (e.g., indentations, depression, through-holes, pockets, hollows, cut-outs and pits). The object is to apply a thin coating to the feature, but otherwise preserve the feature's underlying dimensionality. This is in contrast to the layers of material laid down by Draghi that are so thick so as to require a machining step to blend the edges of the deposit with the underlying substrate. Even if Draghi's crack could be construed as a *feature* of a substrate (which it cannot), the result of Draghi is not a coating on that feature, but a complete eradication of the feature. This is not the claimed method.

The coating of the present invention is obtained not by melting an alloy from a tape onto the feature as in Draghi, but through a mechanism that mimics a local vapor deposition. A halide activator reacts with aluminum ions from the aluminum source in the applied tape to form an Al-halide intermediate within the contained space. The Al-halide intermediate reacts with the target surface to form an aluminide coating on the target surface. It should be apparent that the aluminum source used in the practice of the present invention does not melt and flow into the feature forming the target surface as in Draghi. Rather, the aluminum source of the tape in the invention merely provides a source of aluminum ions, which then react with the halide activator to form a reactive Al-halide intermediate in the contained space. This is why the specification indicates that the aluminum source is selected from "high melting point aluminum compounds that do not melt during the heating step" (page 9, lines 22-24). The reactive Al-halide intermediate then reacts with the target surface. The result is a thin coating on the target surface. The coating arises not from melting of the aluminum in the tape, but from a mechanism that projects a reactive Al-halide intermediate through the contained space. Draghi fails to teach formation of an aluminide coating on a target surface by this mechanism. Indeed, Draghi does not describe a tape capable of doing so.

The rejection admits that Draghi does not teach the tape composition of the present invention, but alleges that Olson teaches such a tape. The rejection alleges that one of ordinary skill in the art would have been motivated to substitute the tape of Olson for the tape of Draghi. Applicant respectfully disagrees.

One skilled in the art would not combine the teachings of Draghi and Olson, as alleged by Examiner, since those teachings are incompatible. Draghi requires a vacuum when decomposing the tape material under heating (col. 4, lines 64-69). Olson requires an inert atmosphere during tape heating (col 3., lines 1-2). Moreover, the Draghi process of melting an alloy from a tape under vacuum could not be adapted to the present invention, which relies on a mechanism that mimics a local vapor deposition. A vacuum would pull the reactive Al-halide intermediates from the contained space, thereby interfering with the formation of an aluminide coating on the target surface.

Moreover, the rejection has overlooked a key feature of the claimed invention. The coating tape in the practice of the invention is in out-of-contact relation with the target surface in forming an aluminide coating on the latter. Examiner maintains that Draghi incidentally meets this requirement to the extent the Draghi tape may be applied over a crack. Even assuming *arguendo* that Draghi satisfies the claimed out-of-contact relationship, Olson teaches away from it. With respect to out-of-contact coating methods which rely on vapor phase aluminiding, Olson states that "problems are associated" with some of these processes, particularly the formation of oxides (col. 1, lines 40-50). Olson then proceeds to describe a localized aluminide coating process that relies on positioning a tape *on* the surface to be coated, not in out-of-contact relationship with that surface.

Considering Olson as a whole, one of ordinary skill would never make the modification of Draghi that Examiner proposes, that is, to substitute the tape of Olson in the alleged out-of-contact coating method of Draghi. Olson teaches away from out-of-contact coating methods. Olson is an in-contact coating method, i.e., the coating tape must be in contact with the metal surface to be coated.

Even if combined, the resultant of Draghi and Olson is not the present invention. Neither reference teaches forming an aluminide on a target surface by means of a reactive Al-halide generated by a coating tape in out-of-contact relationship with the target surface. Draghi fails to teach coating tapes capable of generating such intermediates, and Olson teaches away from

coating methods that rely on coating compositions in out-of-contact relationship with a target surface.

For the foregoing reasons, the claimed invention would not have been obvious to one of ordinary skill in the art over Draghi in view of Olson.

The claims remaining in the application are believed in condition for allowance. An early action toward that end is earnestly solicited.

Respectfully submitted,

THOMAS KIRCHER

BY _____

DANIEL A. MONACO
Registration No. 30,480
DRINKER, BIDDLE & REATH, LLP.
One Logan Square
18th and Cherry Streets
Philadelphia, PA 19103
(215) 988-3312 ph.
(215) 988-2757 fax
Attorney for Applicant